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Impact of an Educational Intervention on the Prescribing of Antimalarials at the University of Benin Teaching Hospital

Abstract

Purpose: To evaluate the impact of an educational intervention on antimalarial prescribing among internal medicine residents at the University of Benin Teaching Hospital.

Methods: A sample of residents was given blank prescription orders to write prescriptions for uncomplicated malaria. This was followed the next day by educational intervention which focused on the World Health Organization's 'P Drug Concept' using malaria as a case study. One week later, the initial survey was repeated. Baseline and post-intervention prescriptions were matched by consensus between the authors and scored. Data were analyzed with SPSS version 16.0 using paired t tests for prescription scores.

Results: Forty-six residents participated in the baseline survey and 49 post-intervention; 31 pairs of prescriptions matched. Artemisinin-based combination therapies (ACTs) accounted for 81% of antimalarials prescribed at baseline, 75% of which were in brand names. No prescription stated dosage in milligrams at baseline. Generic prescribing improved with less than 50% of prescriptions written in brand names post-intervention ($p = 0.001$). One resident provided instructions for labelling post-intervention.

Conclusion: Focused educational intervention resulted in improved generic prescribing of antimalarials in this experimental setting. Routine academic meetings should provide opportunities which can be inexpensively used for interventions to improve the utilization of medicines in Nigerian health care facilities.

Keywords: Antimalarial prescribing, Educational intervention, Residents, Benin City.

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Introduction

Teaching hospitals are crucially positioned to enable interventions to promote the rational use of medicines in Nigeria: training of medical, nursing and other health professionals occurs at

these centres and persons exiting such programs become key players in drug utilization in public and/or private settings. Drug utilization attitudes formed earlier in individuals' careers are more likely to endure than those formed later [1] thus, interventions to promote the rational use of

medicines in training institutions (while future practitioners are in their 'formative' years) should be strengthened. Opportunities provided by academic departmental meetings in hospitals could be so utilized. This is particularly important in a country like Nigeria where costs and other challenges may militate against efficient interventions to promote the rational use of medicines.

The Nigerian antimalarial drug policy was revised in 2005 following reports of resistance of *Plasmodium falciparum* to chloroquine and sulfadoxine/pyrimethamine across the country [2]. Artemisinin-based combination therapies (ACTs) have since become the standard of care for the treatment of uncomplicated malaria - these are combinations of short-acting artemisinin compounds co-formulated or co-packaged with longer-acting 'partner' medicines e.g. amodiaquine, mefloquine and sulfadoxine-pyrimethamine.

The rational use of antimalarial medicines requires that individuals presumed to have malaria receive antimalarial medicines that are appropriate to their needs in the right dosages and formulations, for the right duration and at an affordable cost to them and the community [3]. Irrational use of antimalarials creates selection pressure for the development of resistance [4]. Majority of Nigerians pay out-of-pocket for medical care and with ACTs costing 5-20 times more than chloroquine [5] efforts to promote rational utilization must be strengthened if their lifespan is to be assured [4]. The complicated dosing regimen for some ACTs has been highlighted [6] and may hinder prescribing among the 'untrained'. Achieving rational prescribing of ACTs in public health facilities is likely to influence their utilization in informal sectors [7] as well. In particular, generic prescribing of ACTs is imperative if confusion and medication errors that could arise from the numerous branded ACTs that are available over-the-counter are to be avoided.

We took the opportunity of a departmental clinical meeting to institute an educational intervention focused on improving generic prescribing of ACTs among resident doctors in the Internal Medicine Department of the

University of Benin Teaching Hospital (UBTH) in Benin City, Nigeria.

The purpose of this study was to assess the impact of an educational intervention on antimalarial prescribing among internal medicine residents in UBTH.

Methods

The study was carried out among a cross-section of residents in the Department of Medicine, UBTH, in Benin City, Nigeria. The latter is a tertiary hospital serving the south-south geographical region of Nigeria. At the time of this study, the hospital had a bed space of 620; the Internal Medicine Department had 20 intern doctors, 30 registrars and 16 senior registrars, with 15 consultant staff.

A non-probability (convenience) sample of residents who were present at a morning meeting in May 2009 was taken. Prescription orders were provided and respondents were requested to write a prescription order for the treatment of uncomplicated malaria in an adult. The prescriptions were collected at the close of the meeting. An educational intervention was instituted the following day at an academic departmental meeting: the World Health Organization's (WHO's) P drug concept was discussed using the WHO reference material [8] with malaria as a case study. Principles of rational prescribing were emphasized. Educational intervention also focused on (1) advantages of generic prescribing, and (2) the high level of brand name prescribing of antimalarial medicines observed in a pilot survey within the department in the preceding week - 100% of antimalarials had been prescribed in brand names.

One week after intervention, residents attending a morning meeting (same scenario as at baseline) were requested to write a prescription for the treatment of uncomplicated malaria. Prescriptions pre- and post-intervention were matched by consensus between the authors and two senior registrars in Clinical Pharmacology/Therapeutics and scored: a score of 1 was awarded if identifying details were included, and 0 if they were not. If the antimalarial prescribed was an ACT a score of 1 was awarded, and 0 if the

antimalarial was non-ACT. Prescriptions in generic names were scored 1; brand names – 0; correct dosages in milligram – 2; dosages in number of tablets – 1; non-inclusion of dosage – 0. A score of 2 was awarded for dosing frequency stated in hours between intervals; 1 – if otherwise stated, and 0 – if the dosing frequency was not stated. A score of 1 was awarded for the duration of therapy and 0 if the duration was not stated. Total prescription scores comprised scores awarded for details that identified prescribers and patients, as well as ‘antimalarial prescribing scores’. The latter comprised scores awarded for the inclusion of names, dosages, dosage strengths, dosing intervals, duration of therapy and instructions for labelling of prescribed antimalarials.

Data were analyzed using paired Student t tests to compare baseline and post-intervention scores. Unmatched prescriptions were excluded from further analyses.

Ethical Consideration

The Head of the Outpatients’ Pharmacy Unit, UBTH gave approval for the assessment of prescriptions written by doctors in the Medical Outpatients’ Clinics in the pilot survey. Participants received verbal information regarding the study prior to data collection.

Participation was voluntary and submitting a prescription was the evidence of consent.

Results

Forty-six residents participated in the baseline survey; 49 post-intervention (100% response each). Over two-thirds (81%) prescribed artemether-lumefantrine at baseline, 74.2% in brand names (Table 1). No prescription had dosage stated in mg strength at baseline. Two samples of prescriptions obtained at baseline are shown in Figure 1 to highlight the confusion prescribers may experience in prescribing ACTs. Post-intervention, significantly more doctors (58.1% as against 25.8% at baseline) prescribed medicines in generic names ($p=0.001$); one provided instructions for the labelling. Maximum prescription scores increased post-intervention and fewer medicines were prescribed although the difference was not statistically significant (Table 2).

Discussion

This study was motivated by anecdotal evidence of poor antimalarial prescribing, supported by findings from a pilot study at the Internal Medicine Department of the University of Benin Teaching Hospital (UBTH). The study sample is representative of residents at the study site.

Table 1: Medicines prescribed at baseline and post-intervention

Prescription Parameters	Number of prescriptions (%)		p value
	Baseline	Post-Intervention	
No. of medicines per prescription			
1	27 (87.1)	30 (96.8)	
2	2 (6.5)	0	0.103
3	2 (6.5)	1 (3.2)	
Antimalarials prescribed			
Antimalarial			
AL	28 (90.3)	29 (93.5)	0.572
AQ	1 (3.2)	1 (3.2)	1.000
AM	1 (3.2)	0	0.325
Chloroquine	1 (3.2)	1 (3.2)	*
Generic or Brand Name prescribing			
Generic	8 (25.8)	18 (58.1)	0.001
Brand name	23 (74.2)	13 (41.9)	

*p value could not be computed because the standard error of the difference is zero (0)

AL: arthemeter-lumefantrine; AQ: artesunate-amodiaquine; AM: artesunate-mefloquine

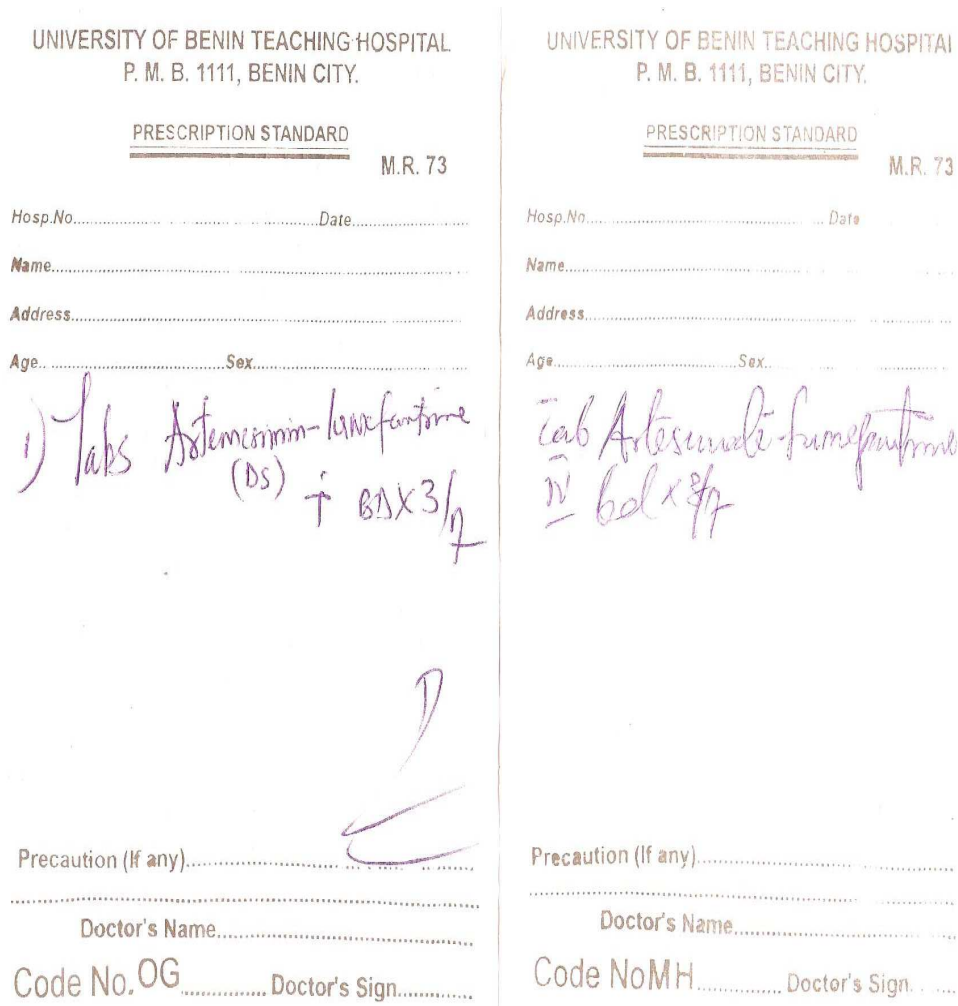


Figure 1: Two samples of prescriptions written in the baseline survey

Table 2: Prescription scores at baseline and after educational intervention

	Baseline	Post-Intervention	p value
Range	4-13	4-17	
Total Prescription Score (±SD)	7.8 ± 3.6	8.2 ± 3.9	0.5
Antimalarial prescribing score (± SD)	1.2 ± 0.4	1.6 ± 0.5	0.001

having incorporated over two-thirds of all residents. Respondents are likely to share many prescribing characteristics with other internal medicine residents across Nigeria

It should be expected that Nigerian doctors (and especially residents in internal medicine) should write exemplary prescriptions for the treatment of malaria, given that malaria is the most prevalent communicable disease in the country. Reasonably

good adherence to the national malaria treatment policy change which stipulates ACTs as the standard of care for uncomplicated malaria is evident in the high proportions (81%) of prescriptions for ACTs at baseline. However it may be argued that the prescriptions written by respondents may have been different in 'real world' clinical settings. It might also be erroneous to assume that prescriptions obtained

in this survey are reflective of practices outside the teaching hospital, or beyond the Department of Medicine.

Before the national malaria treatment policy change ACTs were prescribed in only 3% of prescriptions for uncomplicated malaria in south-east Nigeria as at 2003 [9]. In 2006 in northern Nigeria just over 10% of antimalarial medicines prescribed in a teaching hospital were for ACTs [10] while in a tertiary hospital in south-west Nigeria in the same year 26.2% of prescriptions for children with malaria were for ACTs [11]. Our findings suggest better adherence to national malaria treatment policy guidelines but differences may exist between and within health care facilities. Again, the limitation that these were 'simulated' prescriptions should be borne in mind.

The predominance of brand name prescribing at baseline may be explained by confusion about the active ingredients in ACTs (e.g. whether 'artemisinin' or 'artesunate' or 'arthemeter' – as shown in Figure 1). Providing feedback to prescribers regarding their prescribing performance has been highlighted as an important action to promote rational prescribing [12, 13, and 14]. This was employed in this study using data from the pilot study as material for educational intervention. The result was an impressive improvement in generic prescribing of antimalarials.

A "P medicine" (P representing Personal) [8] is a medicine which a prescriber studies within a group of medicines for some specific indication, becomes familiar with and chooses to use [8] on the basis of evidence regarding its efficacy, safety, effectiveness and efficiency. For malaria in Nigeria as of today, this would be an ACT [8, 15]. Curiously, one prescriber in this study retained chloroquine as her/his P antimalarial – in spite of national guidelines and the educational intervention. We recognize that the effects reported in this study occurred in the short-term. Assessing retention (or otherwise) of the changes observed in this study would be worthwhile.

Conclusion

Educational interventions to achieve and/or improve rational prescribing need not be

elaborate or expensive: routine departmental meetings provide opportunities which may be effectively and efficiently used to improve prescribing and the rational use of medicines in health care facilities in Nigeria. In this study generic prescribing of antimalarials improved significantly.

Conflict of Interest

We have no conflicts of interests associated with this work

Contribution of Authors

We declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors. OAA conceived and designed the work, OAA and AO collected and interpreted the data while OAA prepared the manuscript which was approved by both authors.

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